UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,516	07/10/2006	Shoufu Hou	608-483	5878

23117 7590 04/28/2010

NIXON & VANDERHYE, PC
901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

EXAMINER	
SHUMATE, ANTHONY R	
ART UNIT	PAPER NUMBER
1797	
MAIL DATE	DELIVERY MODE
04/28/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/585,516	HOU ET AL.	
	Examiner	Art Unit	
	ANTHONY SHUMATE	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 December 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-22,24-29 and 31-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18-22,24-29 and 31-35* is/are rejected.

7)☒ Claim(s) *19, 21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Amendment filed 24 December 2009 has been entered and fully considered.

2. Claims 18-22, 24-29, and 31-35 are pending, of which claims 18-22, 24-29 and 31 were amended, 32-35 were new. The amendments of claims 18-22, 24-29 and 31 are supported by the originally filed disclosure. The new claims 32 and 34-35 are supported by the originally filed disclosure.

3. The previous 35 USC 112 rejection is withdrawn in light of Applicant's amendments to the claims. But, a new 35 USC 112 rejection(s) is necessitated by amendment.

4. The previous oath or declaration objections are withdrawn in light of Applicant's filing a new oath or declaration.

5. The previous 35 U.S.C. 102(b) rejection of claims 17 and 30 is withdrawn in light of Applicant's amendments to the claims.

Information Disclosure Statement

6. Any foreign language documents submitted by applicant has been considered only to the extent of the short explanation of significance, English abstract or English equivalent, if appropriate.

Claim Objections

1. Claim 19, 21 and 22 objected to because of the following informalities:

Claim 19 has the phrase, "disfigurements of the substrates are preoccupied with the filler," which is unclear. It is the Examiner's position that a disfigurement of a substrate can not be preoccupied, (i.e. worried, anxious, or inattentive). Though, It is the Examiner's position that a disfigurement of a substrate can be filled.

Claim 21 has the phrase, "a an electroless," which is, respectively, grammatically incorrect.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 18-22, 24-29, and 31-35 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 18 has the step of "post-processing where the pore fillers residing in the pore-channels of the porous substrate are partly removed or reduced in volume through heating" after the drying step which is unclear. Particularly since, the instant specification at page 5 contradicts the claimed process by having the "post-processing..." step prior to the drying.

Claim 19 has the phrase, "performed under vacuum, preferably by immersing the porous substrate in a solution of pore filler in order to ensure that the pores and the disfigurements of the substrates are preoccupied with the filler and that there is no palladium ingress into the pores during the consecutive preparation steps," and with claim 19 having the phrase, "preferably," claim 19 is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

Claim 33 has the phrase, "the heating in step 6 is done by.... calcination," which is unclear. Particularly since, the instant specification at page 5 contradicts the claimed process by having the calcination step separate from the step of "post-processing where the pore fillers residing in the pore-channels of the porous substrate are partly removed or reduced in volume through heating." Furthermore, heating cannot be done by calcination. Calcination is the result of heating, and heating is not the result of calcination.

Also, for instant claim 33 has heating cannot be done by pyrolysis. Pyrolysis is the result of heating, and heating is not the result of pyrolysis.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the

explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 28 recites the broad recitation carbonate colloid, and the claim also recites alkali carbonate colloid which is the narrower statement of the range/limitation.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the

claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 29 recites the broad recitation carbonate precipitates, and the claim also recites alkali carbonate precipitates which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 18-22, 24-29, and 31-35 rejected under 35 U.S.C. 103(a) as being unpatentable over KAWAE et al. (US 6,066,592) in view of BLAHA (US 3,353,982) as evidenced by WELLS (US 3,918,927), MUNDSCHAU (US 2003/0183080) and JUNG et al. (US 3607787 A).

For instant claims 18 and 20, KAWAE et al. teaches at column 6 lines 29-33 a porous substrate support.

But, KAWAE et al. does not specifically teach rinsing/washing and drying the porous substrate support.

But, it is the Examiner's position that it is well known to rinsing/washing and drying an item for the benefit of removing dirt. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to initially rinsing/washing and drying the porous substrate support of YOSHIYUKI for the benefit of removing dirt.

[Also, WELLS (US 3,918,927) provide extrinsic evidence at the abstract electroplating a substrate which is filled with silica. As, WELLS provide extrinsic evidence at column 3 lines 25-55 in a conventional plating processes to produce a plated product each conditioning step is followed by one or more water rinses.]

Also for instant claim 18, KAWAE et al. teaches at column 2 lines 35-40 treating the porous substrate support with a pore filler (i.e. in order to decorate the pores of the support and, the disfigurements of the substrate surface).

Also for instant claims 18 and 20, KAWAE et al. teaches at column 6 lines 29-42 immersing the porous substrate in $SnCl_2$ solution and $PdCl_2$ solution (i.e. sensitizing and activating with a palladium solution the decorated substrate support).

Also for instant claims 18 and 20, KAWAE et al. teaches at column 6 lines 43-45 plating with palladium solution (i.e. plating the resulting support with a palladium solution to form the two layer composite membrane).

Also for instant claims 18 and 20, KAWAE et al. teaches at column 6 lines 65-67 the treated porous alumina tube was maintained at 900 ^{o}C for 12 hours (i.e. drying, and subjecting the resulting composite membrane to a post-processing where the pore fillers residing in the pore-channels of the porous substrate are heated).

But, KAWAE et al. does not specifically teach pore fillers residing in the pore-channels of the porous substrate are partly removed or reduced in volume through heating.

Though, BLAHA also teaches at column 1 lines 5-23 membrane with a porous substrate with the pores filled. Also, BLAHA teaches at column 1 lines 30-34 the pores are filled with calcium carbonate. It would have been obvious to one having ordinary skill in the art at the time the invention was made to simply substitute the pore filler of KAWAE et al. with calcium carbonate of BLAHA. (KSR)

It is the Examiner's position that the calcium carbonate of BLAHA during the heating step taught by KAWAE et al. at column 6 lines 65-67 would intrinsically be partly removed or reduced in volume through heating.

Alternatively, It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the pore filler of calcium carbonate of BLAHA with the process of KAWAE et al., since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. (MPEP 2144.07)

[Also, DROST et al. (US 6,649,559 B2) provides extrinsic evidence at column 4 lines 15-30 filling the pores of a porous substrate; applying a metal to the substrate; and removing the pore filler.]

[Also, MUNDSCHAU (US 2003/0183080) provides extrinsic evidence at paragraph 64 hydrogen transport membranes; and materials (e.g. ceramics or metals) having pores which are at least partially filled with another type of material.]

[JUNG et al. (US 3607787 A) provides extrinsic evidence at column 3 lines 73-75 magnesium carbonate, which are capable of forming pores in the finished electrodes and/or fillers.]

For instant claim 19, the claim limitation describes, “step 2 is performed under vacuum." KAWAE et al. teaches at column 5 lines 30-36 the tubular porous substrate immersed in solution and the inside of the tube sucked by a vacuum pump. It would have been obvious to one having ordinary skill in the art

at the time the invention was made to provide the vacuum to step 2 of KAWAE et al. for the benefit of sucking as taught by KAWAE et al. at column 5 lines 30-36.

Furthermore, it is the Examiner's position that the claim phrase, "preferably by immersing the porous substrate in a solution of pore filler in order to ensure that the pores and the disfigurements of the substrates are preoccupied with the filler and that there is no palladium ingress into the pores during the consecutive preparation steps," is optional.

For instant claims 21 and 22, KAWAE et al. teaches at column 6 line 40-54 immersing the porous substrate into a plating solution of $Pd(NH_3)_2Cl_2$, 2Na·EDTA, ammonia (i.e. NH_3), $H_2NNH_2·H_2O$ (i.e. NH_2-NH_2-H_2O), and H_2O (i.e. electroless plating solution) to plate the porous substrate.

For instant claim 24, KAWAE et al. teaches at column 6 lines 65-67 the treated porous alumina tube was maintained at 900 ^oC for 12 hours. Thereby the claim phrase, "the composite membrane is dried and then calcined at at least 300 ^oC," is met.

For instant claim 25, KAWAE et al. teaches at column 2 lines 35-40 the porous substrate preferably comprises particles each having a diameter being 1.5-6.0 times larger than the average diameter of fine pores. Also, KAWAE et al.

teaches at column 3 lines 18-21 the average diameter of the fine pores is 0.1 to 3.0 μm.

Therefore, it is the Examiner's position that the particle diameter of KAWAE et al. 0.15 μm, which is within the claimed range of the pore fillers used have a particle size lower than 0.2 micron.

For instant claims 26 and 28 and 29, with consideration given to the KAWAE et al. and BLAHA combination, BLAHA teaches at column 1 lines 30-34 calcium carbonate (carbonate precipitate) (carbonate colloid).

For instant claim 27, It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the Al-sol with KAWAE et al., since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. (MPEP 2144.07)

For instant claim 31, KAWAE et al. teaches at column 3 lines 14-18 a porous substrate of porous glass.

For instant claim 32, it is the Examiner's position that it is well known in the art at the time of the Applicant's invention to remove excess of a compound from

a surface if too much was applied to the surface. It would have been obvious to one having ordinary skill in the art at the time the invention was made to when an excess of pore filler resides on the substrate support surface, cleaning the substrate support in order to remove this excess of surface pore filler of KAWAE et al., since it was known in the art that to remove excess of a compound from a surface if to much was applied to the surface. (well-known, or to be common knowledge)

For instant claim 33, KAWAE et al. teaches at column 6 lines 65-67 the treated porous alumina tube was maintained at 900 ^{o}C for 12 hours. Thereby the claim phrase, "the heating in step 6 is done by either pyrolysis or calcination," is met.

For instant claims 34 and 35, KAWAE et al. teaches at table 1 a particle diameter (i.e. size) of 0.05 μm.

Therefore, it is the Examiner's position that the particle diameter of 0.05 μm is within the claimed range of less than 0.1 micron.

Alternatively, It would have been obvious for one having ordinary skill in the art at the time the invention was made provide a particle size (diameter) within the claimed range of lower than 0.1 μm of KAWAE et al., since it has been held that where the general conditions of a claim are

disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

Also, It would have been obvious for one having ordinary skill in the art at the time the invention was made provide a particle size (diameter) within the claimed range of lower than 0.05 μm of KAWAE et al., since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (MPEP 2144.05 PART II-A)

Response to Arguments

7. Applicant's arguments filed 24 December 2009 have been fully considered but they are not persuasive.

8. Applicant's arguments with respect to claim(s) have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendment.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. JONES et al. (US 20030035943) February 20, 2003 Multilayer microporous films and methods.

b. ROBERTS et al. (US 6180559 B1) January 30, 2001 Supported catalysts and catalyst support materials and process for the manufacture of 1,2-epoxybutane.

c. HARDY et al. (US 3689611 A) September 5, 1972 METHOD OF MAKING GLAZED CERAMIC BONDED EXPANDED VERMICULITE ARTICLES.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY SHUMATE whose telephone number is (571)270-5546. The examiner can normally be reached on M-Th 9-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Marcheschi can be reached on (571)272-1374. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A.S./
Examiner Art Unit 1797

/Jason M. Greene/
Primary Examiner, Art Unit 1797